

**Opening Statement of Dr. Richard L. Thurston<sup>1</sup>**  
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**FTC/DOJ Hearings on Competition and Intellectual Property**  
**Law and Policy in a Knowledge-Based Economy**

**Business and Other Perspectives on Real-World Experience with Patents**

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Washington, D.C.

**Introduction.**

The Founding Fathers of the United States of America provided in the Constitution for Congress “to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.”<sup>3</sup> U.S. Patent system proponents argue that the patent grant created by the Founding Fathers creates the potential for financial and other economic returns to the inventor, thus providing incentives to invest in expensive and time consuming research and development (“R&D”) necessary to promote technological advancement and entrepreneurism. In return for the opportunity to obtain an economic return, the inventor not only must disclose to the public the invention, but also is given a time-limited monopoly right to exploit the invention. Absent legal protection and economic incentives, there may well be little motivation for inventors to invest in new R&D since new products could be copied cheaply by “free rider” competitors.

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<sup>1</sup> Dr. Thurston is Vice President and General Counsel of TSMC. His career started as an associate at the Philadelphia-based law firm of Duane Morris. From 1984 – 1996 he worked at Texas Instruments, where he was Vice President, Corporate Staff, and Assistant General Counsel. From 1996 – 2001 he was a senior partner at the Dallas-based law firm of Haynes and Boone, where he helped to create a technology practice for the firm and established the firm’s “Telecom Corridor” office in Richardson, Texas. Immediately prior to joining TSMC, he was a founding partner of Kelt Capital Ventures, LP, a Dallas-based consulting and venture capital organization. Dr. Thurston earned a Ph.D. from the University of Virginia and a JD from Rutgers School of Law, Camden, New Jersey.

<sup>2</sup> Taiwan Semiconductor Manufacturing Company is the world’s largest semiconductor contract manufacturer, or “foundry.” Established in the late 1980’s, TSMC is headquartered in the Hsin Chu Science-Based Industrial Park, Taiwan, Republic of China. With manufacturing operations located in Taiwan and in the United States, TSMC has had issued in the U.S. nearly 2000 semiconductor manufacturing process-related patents since 1988.

Taiwan Semiconductor Manufacturing Company (“TSMC”) commends the FTC/DOJ efforts to review the issues surrounding intellectual property, innovation, entrepreneurship and their interplay with US competition laws. We especially welcome the opportunity to share our thoughts and recommendations on this important topic.

### **A Historical Perspective**.<sup>4</sup>

A strict reading of the U.S. Constitution could easily lead any reviewer to conclude that the Founding Fathers had intended to grant to inventors a specific monopoly right to exploit their patented inventions for relatively unrestricted economic gain. To the contrary, it can be argued that at least Messrs. Jefferson (the first U.S. administrator of patents), Franklin, Madison, and Pinckney intended to provide protection to the country and to encourage inventions that were beneficial to the country as a whole.

The considerations given to the enactment and implementation of the Patent Clause were considerable in the late 1700’s and early 1800’s. The personal papers of Jefferson and Madison are replete with discussion on this point. Jefferson and Madison were opposed originally to a monopoly grant to inventors because of a deep-seated concern that such rights could be abused against the better interests of public good and welfare. Jefferson, when writing to Madison about a “Bill of Rights,” *wanted to prohibit all monopolies of any kind* because of his abhorrence of British monopolistic practices. He ultimately changed his reservation:

“That ideas should freely spread from one to another over the globe, for the moral and mutual instruction of man, and improvement of his condition, seems to have been peculiarly and benevolently designed by nature...

Inventions then cannot, in nature, be subject of property. Society may give an exclusive right to the profits arising from them, an encouragement to men to pursue ideas which may produce utility, but this may or may not be

<sup>3</sup> U.S. Constitution, Art. I, Section 8, Paragraph 8.

<sup>4</sup> The following discussion is based on joint research undertaken in the mid-1990’s as part of a larger study on antitrust laws and innovation by Steven P. Reynolds, Esq., R. Darryl Burke, Esq., and Dr. Richard L. Thurston, Esq.

done according to the will and convenience of the society, without claim or complaint from anybody... ”<sup>5</sup>

Writing in the Federalist, No. 43, Madison came out in favor of a restricted patent grant system because the “public good fully coincides...with the claims of individuals.” A significant factor in his support, however, was the change in draftsmanship of the Patent Clause so as to cover the “securing” of a right, rather than of guaranteeing a favor of special privilege to all inventors or creators. Compensation and other considerations given to inventors would be “just” but balanced in the best interests of the nation-at-large. While inventors could profit from the fruits of their toil, such entitlement would only exist to the extent that the inventions provided society with a fundamental ongoing productive value. We should continue to appreciate and honor the spirit and intentions of Jefferson and Madison.

### **Innovation in the Microelectronics Industry**

Innovation is at the core of American entrepreneurism and competitiveness. Many factors influence innovation, whether it is to create for creativity’s sake; to create for the public good, to create for personal notoriety, or to create purely for commercial advantage or economic gain. Innovation has been a key factor in the

growth of the microelectronics industry during the past several decades, especially as concerns the revolution which has been experienced in the semiconductor based segment of that industry.

In the case of TSMC, once a “start-up” established merely 14 years ago during the late-1980’s, innovation and entrepreneurship have been key principles at the heart of the company’s existence and culture. They are increasingly important to our future success. The establishment of TSMC as the world’s first semiconductor foundry (and today’s largest semiconductor contract manufacturer) enabled the creation and proliferation of a new generation of semiconductor companies - the “fabless” semiconductor company.<sup>6</sup> With TSMC’s emergence as a credible manufacturer, Silicon Valley and other semiconductor start-ups no longer needed to be dependent on

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<sup>6</sup> In the semiconductor industry, the facility in which semiconductor devices are manufactured is referred to as a wafer fabrication facility, or “fab” for short. A “back-end” facility is commonly referred to as the assembly and test operations where the semiconductor chips are packaged and tested for eventual incorporation into end equipment such as digital cameras, cellular phones and notebook computers.

the integrated device manufacturers (“IDMs”) such as IBM, Motorola, Intel, TI, etc., for often scarce capacity and more importantly, manufacturing process technology resources. The emergence of the semiconductor foundries has allowed venture capital investors better to utilize investment funds since their invested companies no longer have been required to expend significant capital for brick and mortar. Instead of building costly new facilities, the start-ups could focus limited, valuable resources on R&D and the creation of technologies and products that have truly exceeded the wildest expectations of Messrs. Jefferson and Madison as to benefiting society and mankind.

Efficient use of limited financial resources has been a material factor behind the emergence of new semiconductor technologies, whether it is the technologies which drive the functioning of digital TVs and digital cameras, the global operation of cell phones and PDAs, or the inner workings of the Xbox game systems. The voracious appetite of American and global consumers for advanced technologies is growing, but it is not without a price. Back in the late 1980’s, a world-class semiconductor fab cost approximately \$250 million to build. Today, one of TSMC’s world-class twelve-inch facilities costs in excess of \$4 billion to build and fit out for manufacturing.<sup>7</sup> Without new technological breakthroughs, future fab costs will continue to mount. Consequently, fewer companies can afford to build their own fabs. TSMC’s customer base exceeds 150 fabless companies and includes an increasing list of IDMs.

Furthermore, to increase the density of the circuitry of a semiconductor device requires tremendous innovative efforts to advance the feature size of the devices. To achieve the densities and efficiencies of new device technologies, further requires extensive R&D efforts and expense on the part of TSMC and other manufacturers to achieve high quality, reliable, and high yield bearing manufacturing processes. To manufacture each new device generation requires TSMC to spend in excess of \$300 million a year on R&D efforts alone.<sup>8</sup>

In order to assist in the creation of new fabless companies and the creation of new technologies, TSMC has funded three venture capital funds to invest in potential customers. Additionally, we are considering the creation of additional venture capital funds to continue to finance innovation, including assisting start-ups fund patent

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<sup>7</sup> The term “twelve inch” refers to the size of the silicon wafer on which semiconductor devices are built. The twelve inch wafer is significantly more costly to build than its 8” predecessor. The geometries of the devices built on a 12” wafer are now of the .13micron size.

<sup>8</sup> This amount does not include investments of our customers in joint development projects, such as the one recently announced by TSMC with Philips (Netherlands) and ST Microelectronics of France.

prosecution activities. Other companies in and throughout the industry have taken similar initiatives. For example, while at Texas Instruments, I helped to establish TI's venture capital arm in early 1996, TI Ventures, which has invested significantly in emerging growth companies since 1996. I roughly estimate that venture capital funding of emerging growth companies will cost in excess of \$100 million dollars for each company that successfully takes its product to the marketplace. Most of the investment will go into R&D and productization. However, increasingly large sums of invested funds are spent on the prosecution of patent portfolios and licensing from third parties.

### **Role of Patents and Other Intellectual Property and Related Trends in the Semiconductor Industry.**

Intellectual property, especially patents and trade secrets, play a significant role in the success and failure of semiconductor companies. For TSMC, the value added is multiple:

- a. Enabling TSMC to manufacture securely and freely;
- b. Enabling TSMC to sustain competitive advantage (including but not limited to: i.) Enhancing the global technological image of TSMC; ii.) Providing to customers additional value added; and iii.) Leveraging access to third party technologies);
- c. Minimizing patent infringement liability/damages/costs (including significant lost management time);
- d. Increasing shareholder value; and
- e. Increasing employee welfare (financial, job security, enhanced working environment, etc.).

Initially, TSMC placed the heaviest emphasis on items #b, d, and e as the underlying value of, and justification for, creating an intellectual property portfolio. During the past several years, the focus has shifted increasingly to items #a and c as the principal reason d'être for creating a strong patent portfolio. Part of the shift is the result of the fact that many of TSMC's senior management originated from TI, IBM and other major semiconductor companies which have achieved significant success in freedom to operate and in financial performance from strong, tested patent portfolios. As we have achieved leadership in advanced process technologies, we also wish to protect those technologies from "free riders" similar to the way in which TI addressed that threat in the mid-1980's.

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Inherently, engineers are extremely creative. They desire to innovate in an unrestricted, non-bureaucratic environment. Innovation is at the core of their motivation, not solely obtaining patents (although that has changed somewhat as incentives (see below) can become significant factors in the filing of disclosures). In obtaining a patent for an innovation, engineers tend to place significant value on the notoriety of obtaining one or more patents and as a credential for one's CV rather than the commercial success of the innovation. Their employers, on the other hand, which have invested significant sums of monies into the R&D efforts of engineering staff (let alone, in many cases, the academic training of engineering talent), want to protect those assets over time. In order to increase productivity in developing patent portfolios, corporations have increased steadily the level of incentivization given to engineering talent beyond base compensation. Incentive awards based on disclosures, issued patents, patents, which withstand legal challenges, etc., are provided as additional incentives. So, too, are stock options and grants in emerging growth companies.

Having spent many years advising entrepreneurs in the start-up of their businesses, I have seen an evolution in the emphasis which investors have placed on intellectual property portfolios. Initially, in the 1970's and 1980's, principal interest was in innovation for innovation's sake and time-to-market principles. Because patents were difficult to enforce in the courts, and since prosecuting a patent meant public disclosure ultimately, patents were often not pursued extensively by the Start-up Company. However, as the courts recognized increasingly intellectual property rights and validated patents as a rule rather than the exception, the attitudes of investors and corporations alike changed dramatically. So, too, did the resources required to protect those interests in the courts.

By the dawn of this century, as a general rule, a microelectronics company would not obtain venture capital funding unless the company had at least one patent application in the mill at the U.S. PTO. Similarly, companies would be required in their funding documents (placement memorandum, contracts, representations and warranties) to provide assurances that their technologies did not infringe any and all other patents or other intellectual property. Finally, VCs increasingly sought to secure their investments with IP collateral by filing security statements against such intellectual property.

Today, most high-tech companies, especially in the semiconductor industry, have

increased substantially their IP budgets so as to place them in a better defensive and ultimately offensive position, portfolio-wise vis-à-vis their competition (known and unknown). Similarly, an increased dedication of budget to pure research has emerged within certain semiconductor companies such as Intel, IBM, TI and TSMC. While continuing to place significant emphasis on innovation for innovation's sake, TSMC also has been increasingly forced by the litigious infringement environment to develop its patent portfolio for defensive/cross-licensing purposes. As a result, we have increased substantially the filing of patent applications principally with the U.S., Taiwan PTOs, and increasingly in other jurisdictions such as the EU, Japan and China. This effort has come at great cost and expense, diverting key resources (monetary and manpower) from commercialization of technologies. We believe that most other companies are in a similar boat and, therefore, the workload of the various PTOs around the world has increased exponentially over the past decade.

Because we must maintain our freedom to manufacture the products of our customers, the filing of increased numbers of patents has been an unwanted necessity to TSMC. Similarly, as the number of patent infringement claims climb, so too must the technical and legal efforts of our company and those of our customers, to counter those claims, especially through expensive and time consuming non-use and prior art investigations. Increasingly, start-up fabless companies and foundries such as TSMC are being subjected to growing infringement claim efforts. Over the past twenty years, I have noticed a significant increase in one's ability to uncover prior art to invalidate patent claims because of the overload of patent examiners globally. Even most sophisticated IT capability is not totally effective in this area. Nevertheless, companies like TSMC are tired of being pushed around unnecessarily and will increasingly undertake efforts to respond in a responsible way for our customers, employees and shareholders.

To the extent that infringement claims and challenges originate from companies which generate revenue principally from the products and technologies which they sell, then fabless and foundry companies alike are capable of addressing the issues in a more business-like, professional manner, and thus better able to evaluate their risks and to develop IP and business strategies alike to anticipate and counter such contingencies. Therefore, a strong TSMC patent portfolio can be, and will be used in cross-licensing negotiations, in joint development projects, as well as in creating basic strategic commercial transactions. Unfortunately, the environment has changed significantly in recent years so that patent "trolling" has become more the rule rather than the exception.

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As economic conditions have deteriorated during the past several years, an unfortunate trend has emerged. First, as many companies close their doors and/or sell off assets, many entrepreneurial companies have emerged solely to purchase IP portfolios from distressed companies and then to generate revenues from licensing efforts. Those companies, just like several other famous non-operational patent holders and their successors, have nothing to lose but everything to gain by threatening litigation<sup>9</sup> and pursuing unrelentlessly significant revenue streams from royalties, even when parties that they pursue already have existing license agreements, but in such cases they are not satisfied with terms and conditions negotiated previously! Don't take this wrong, inventors should be able to be compensated justly for their innovative efforts and to obtain a fair return on their significant investments. That which is wrong with the present environment is that the "trolls" do not have to worry about counterclaims, they do not have to worry about being shut down, or ever having to pay royalties themselves. Normally, they have no ongoing R&D efforts, and no expenses of their own. The playing field has become far from balanced as was intended by the Founding Fathers.

The other development has been the creation by a number of companies of "profit centers" in their licensing activities. As corporations have been unable to sustain competitiveness in the market place, because of their own ineffectiveness (as compared with the environment encountered by TI in the mid-1980's), they have increasingly resorted to generating lost commercial revenues through an aggressive, independent (from business operations) licensing program. Increasingly, as commercial and financial pressures cause many companies to have cut back in their ongoing R&D during the past several years, those companies have sought to rely on older patent portfolios and to milk those portfolios to the fullest extent possible until the patent term expires. In some cases, the profit centers have no connection with business operations and therefore, business solutions are increasingly difficult to negotiate. Thus, the level of litigation may be rising in direct proportion to the worsening of economic conditions within the corporate world.

Consequently, over the past several years, it can be argued, as many have stated in these hearings, that patent prosecution has become increasingly less the result of innovation but rather a defensive and offensive tool in an increasingly litigious world.

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<sup>9</sup> Professor Lerner in his recent prepared statement to the FTC has litigation has increased significantly and has had a deleterious effect on innovation. We concur with Professor Lerner's observations as well as his concern "that an individual will succeed in getting a preliminary injunction to shut down activity



Competitive market forces, on the other hand, have sustained innovation, generally, not related specifically to a well-honed patent system. Providing value to TSMC's customers has been driven by our desire to excel in developing most advanced technologies rather than by the size and quality of our patent portfolio. As a general rule, this situation is still the prevailing nature of competitive forces in the non-Japanese segment of the Asia-Pacific region. However, as a result of WTO initiatives, the environment is also starting to change throughout Asia.

The costs and risks associated by these developments have become substantial. This is particularly true since it is virtually impossible to search all patent databases, thereby becoming increasingly difficult to evaluate infringement claims, the need for licenses, etc.

It is fair to say that the CAFC has enabled the strengthening of patent system beneficially. But, we have seen a vast proliferation of patent litigation as Professor Lerner has noted. If litigation continues to increase, it can and will impact negatively the growth of emerging companies and the creation of new technologies. Small firms will be forced to divert more income away from basic R&D.

While Dr. Richard Levin (President of Yale) on February 6, 2002 noted that the semiconductor industry practice of cross licensing "...put simply, in cumulative technologies, ... are a necessary condition of technical progress..." sustaining that condition may be increasingly problematic and counterproductive over time. Part of the consideration is because of, as Professor Carl Shapiro has identified in an earlier panel and paper, the increasing existence of a "patent thicket." Which may worsen, as it becomes increasingly difficult to commercialize new technologies. In the semiconductor industry, the issue of narrow vs. broad patent claims has becoming threatening to the industry. As in the pharmaceutical industry, we may need to re-evaluate distinguishing between the legal life and economic life of a semiconductor-related patent.

Consequently, TSMC has made a conscious decision to place intellectual property, especially patent portfolio prosecution, at the pinnacle of our strategic planning process. Creating better business process management tools is a high priority. As patent wars in the semiconductor industry may be looming more significantly than in the past as a result of poor economic performance, many companies like ours either

need to seek help from government agencies and/or pay more attention to intellectual capital management. This effort can not be done strictly at the PTO because of the significant increase in filing fees and maintenance costs (estimated by some to be as much as \$250,000 per patent globally filed during the life of the patent). In this respect, patent pruning and licensing of non-essential patents may become more prevalent than in the past.

There are serious dangers inherent, however, in more aggressive patent management as companies either develop more proactive “profit centers” within their licensing activities, or else turn to outside companies to seek out licensing/royalty generating opportunities outside traditional business or licensing areas. The additional costs and burdens on society may become quite costly over time and perhaps start stifling innovation if not properly monitored and perhaps regulated.

#### **Additional Thoughts and Comments.**

This panel and those of the other sessions have identified numerous issues which I have not addressed in the above discussion since they have been addressed ably by others more knowledgeable. In an abbreviated fashion, I would like to reinforce certain comments made earlier as well as raise some additional supportive thoughts (not in any particular order).

- Many patent owners have tried to stretch patents beyond the scope of the real invention thereby creating unfair results;
  - The CAFC has been working hard to address the patent abuse above mentioned by jurisprudence that is guided by the Notice Function of patents and restricts them to a more reasonable scope based on what the public should be able to determine in advance to be the parameters of the invention;
  - The semiconductor industry (and others as well) needs more resources dedicated to the U.S. PTO (instead of siphoning off funds to the general budget) so as to give the U.S. a higher quality patent system consistent with the intent of the Founding Fathers;
  - We should quash ongoing efforts to return to pre-1930's beliefs in the right to exploit patents as a Lockean natural right against which society has no claim – this was not the intention of the Founding Fathers;
- .....

- The tension inherent in the establishment of the US Republic and evident in the public nature of our patent system suggests that political and economic orthodoxy can not and must not last forever – the pendulum must swing back to a more middle ground if innovation is to survive in the U.S. and to be able to withstand future competition from China;
- We agree with Professor Lerner’s concerns about ongoing deleterious affect of proliferation of litigation between large and small firms and generally;
- As to patent pooling - if properly structured, those arrangements are and should continue to be extremely important in enabling the rapid dissemination of new technologies throughout society consistent with the vision of the Founding Fathers. We encourage the FTC and DOJ to make sure that fair, reasonable, but flexible, guidance be given to industry in this area. As Stephen Fox of HP noted, a “one size fits all” approach should not be pursued or tolerated;
- As are a number of other panel participants, TSMC is increasingly participating in standard setting activities concerning semiconductor process technologies and design rules for chip designs (through design libraries and “spice” rules for the manufacturing process). New rules and guidelines should be established in this area.

## **Conclusion**

The FTC hearings are extremely timely and provide an excellent forum to discuss the significant issues surrounding innovation and the nexus between competition laws and intellectual property laws. TSMC appreciates the opportunity to participate in these well-organized hearings. We look forward to initiatives which may arise from the results of the hearings, and offer our support for future guidance which will assist companies in our industry in promoting the competitiveness of our innovative capabilities.

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